DOCUMENT RESUME

ED 384 023 CS 012 189

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TITLE Relationships between Reading Achievement and Leisure-Time Reading in Grades 3, 4, 5, and 6: A Longitudinal Study in the Netherlands.
PUB DATE Apr 95
NOTE 30p.; Paper presented at the Annual Meeting of the American Educational Research Association (San Francisco, CA, April 18-22, 1995).
PUB TYPE Speeches/Conference Papers (150) -- Reports - Research/Technical (143)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Elementary Education; Foreign Countries; Longitudinal Studies; *Reading Achievement; Reading Attitudes; Reading Research; *Recreational Reading; Television Viewing
IDENTIFIERS *Netherlands; Reading Behavior

ABSTRACT

A longitudinal study investigated the effects of leisure time reading (reading at home for pleasure or fun) on pupils' reading achievement in school. Subjects, 736 students in grades 3, 4, 5, and 6 in 30 schools located throughout the Netherlands, had their reading achievement determined five times: at the beginning and end of grade 3 and at the end of grades 4, 5, and 6. The frequency of reading in leisure time was measured intensively with diaries in grades 3, 4, 5, and 6 during 8, 12, 6, and 10 weeks, respectively. Variables such as reading attitude, reading aloud, television viewing, and the reading time at school were controlled. Contrary to widely held assumptions, results indicated no support for the notion that leisure time reading was an important factor in the development of reading proficiency at school. Findings suggest that the initial premise must be reformulated. Leisure time reading may have an effect on the reading proficiency of students only when the amount of reading, the quality of the reading process, and the quality of books being read reach certain threshold values. (Contains 26 references, 4 notes, 2 tables of data, and 5 models.) (RS)

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ED 384 023

RELATIONSHIPS BETWEEN READING ACHIEVEMENT AND LEISURE-TIME READING IN GRADE 3, 4, 5 AND 6: A LONGITUDINAL STUDY IN THE NETHERLANDS

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APRIL 1995
Paper presented to the
1995 Annual Meeting of the AERA

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OVERVIEW OF THE STUDY

The present study has been designed to investigate the effect of leisure time reading on pupils' reading achievement in school. The research involves a four-year longitudinal study (October 1990 - June 1994) into the relation between reading habits and reading skills in grades 3, 4, 5 and 6, carried out in 30 schools located throughout the Netherlands, with a total of 736 students. In this study students' achievement in reading is determined five times: at the beginning and end of grade 3 and at the end of grades 4, 5 and 6 of primary school. In addition to this, the frequency of reading in leisure time[1] is measured intensively with diaries in grades 3, 4, 5, and 6 during eight, twelve, six and ten weeks, respectively. We controlled for important variables such as reading attitude, reading aloud, television viewing and the reading time at school. To investigate the relationships between leisure time reading and reading performances covariance structural analysis via LISREL is used (Jöreskog & Sörbom, 1988). The hierarchical structure of the data (students in classes) is taken into account by means of the multi-level procedure proposed by Muthén (Muthén, 1989, 1990; Hox, 1993).

INTRODUCTION

Reading is rightly considered to be very important. Personal development, social and cultural participation, participation in education and professional development all benefit from a good level of proficiency in reading comprehension. Besides its value for individual purposes, literacy also plays a crucial role at a social level in keeping, transmitting and further developing of knowledge and cultural expressions.

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[1] Leisure-time reading is defined in this study as: reading at home for **pleasure** or **fun**. Reading assignments or reading preparations (prep) are excluded in this definition.

After just one year of reading instruction, significant differences appear in the reading proficiency levels of children. These differences are frequently perpetuated during the children's school careers, and may even increase (Stanovich, 1986). The specific nature of these differences, however, is liable to change: at the outset, the differences mainly relate to reading technique, whereas later the main differences are found in reading comprehension (Daneman, 1991).

A variety of factors may be the cause of individual differences in reading proficiency. Firstly, there are differences in learning ability or intelligence, which are very difficult to influence. Secondly, schools can be regarded as potential sources of individual differences. The methods used, the intensity of the teaching, the content of instruction given and the teaching ability of the teachers can vary. Thirdly, there are differences in the children's home backgrounds, so that the degree of stimulation of cognitive and linguistic development varies widely (Leseman, 1992). Fourthly, there are differences in the amount of leisure time reading.

The latter factor has attracted a good deal of attention. The presumed positive effect of leisure time reading on children's performances in reading comprehension tests is believed to be a natural consequence of the activity of reading itself. If children read at home, they are, for example, confronted with aspects which seem to be important to the development of reading comprehension, such as the structure of stories (Idol, 1987). They also build up general knowledge (Anderson, 1977; Anderson & Pearson, 1984) and gain practice in making inferences (Hansen, 1981). Educational research carried out to date suggests that leisure time reading indeed has a positive effect both on children's general cognitive functioning (Botstein, 1990; Freedman & Calfee, 1984; Goody 1977; Havelock, 1980; Olson, 1986) and on their vocabulary and their performance on reading comprehension

tests (Greany & Hegarty, 1987; Anderson, Wilson & Fielding, 1988; Cunningham & Stanovich, 1990; Allen, Cipielewski & Stanovich, 1992).

Close inspection, however, reveals that almost all studies suffer from two severe defects: (1) in most cases the research design does not allow causal statements and (2) the instruments used for measuring the frequency of leisure time reading are disputable. Most research relies on questionnaires for measuring leisure time reading (Koolstra, Van der Voort & Vooijs, 1991; Rowe, 1991; Cunningham & Stanovich, 1990). The reliability and validity of this method of collecting data about leisure time reading is open to severe doubt (Otter, 1993). Two positive exceptions to this are the studies by Allen et al. (1992) and Anderson et al. (1988), in which leisure time reading was investigated using diaries.

However, the research design used by Allen et al. (1992) does not provide a basis for making causal statements. In this study reading performance was evaluated only once, so that the positive relationship which they report between leisure time reading and reading performance can also be explained by confounding (or omitted) variables which were not included in the study.

In the study carried out by Anderson et al. (1988) the data pertaining to leisure-time reading were collected after the posttest of reading comprehension. In the analysis, these data were used as if they were collected in the time interval between the pretest and the posttest. Furthermore, the diary scores were transformed with a logarithmic function, with the result that the correlation with comprehension scores is due to minor differences on the left side of the distribution (i.e. differences between not reading at all and reading occasionally). Before transformation the correlation was negligible.

In summary, there is little or no hard evidence regarding a causal link between leisure time reading and reading achievement in school. The present study has been designed to

avoid the flaws of earlier studies.

METHOD

Schools and pupils

First ten regions were selected as a basis from which to draw the sample. The regions were distributed throughout virtually the whole of the Netherlands. Twenty schools were then selected randomly from each region. At the beginning of the study, in June 1990, four of these twenty schools in each region were approached to participate (40 in total). The choice of schools to approach about taking part in the study was completely random, since the test administrator for each region, who was responsible for organizing the field work, first approached the schools located closest to his or her geographically to ask them to participate. A total of ten schools (in seven different regions) have withdrawn in the course of the study because of changes in their staff and long-term sick leave (the arrival of new, inexperienced teachers), and because schools were about to become merged with another school.

At the beginning of the study, the 973 respondents were 9-year-old pupils in primary education (3rd grade), at the end of the study, in June 1994, the remaining 736 respondents were 12-year-old pupils (6th grade). An overview of the participating schools, classes and pupils is given in Table 1.

Insert Table 1 about here

Study design

Reading comprehension tests were given to pupils in grade 3 in October 1990 and May 1991 (T1, T2), in grade 4 in June 1992 (T3), in grade 5 in June 1993 (T4) and in grade 6 in June 1994 (T5). In grade 3, 4, 5 and 6 the students kept a record of their book reading behaviour at home in diaries for a period of eight, twelve, six and ten weeks (in total 36 weeks), respectively. Table 2 gives an overview of the study design.

Insert Table 2 about here

Table 2 shows that reading behaviour in grade 5 is measured only six weeks and exclusively in the second half of the school year. The reason for this was that funds for the continuation of the originally two-year longitudinal studies were obtained in February 1993.

Data collection

Trained test administrators were responsible for the field work. All test administrators came from the teaching profession and were experienced test administrators.

At the beginning of each of the four years of the study the test administrators had a personal meeting with the teachers involved, and explained the plan of the study and the pupils' diaries to them in person. Prior to this meeting, the students kept a record of their reading behaviour for a few days with the aid of the diaries, so that any problems in completing the diaries could be discussed. In order to prevent schools from dropping out during the study, the test administrators contacted the teachers by telephone before and

after *each* of 36 diary weeks in total to find out about any problems. These telephone contacts were also intended to optimise the personal contact between the teachers and the test administrators.

Instruments

Reading tests

The reading tests used to measure the pupils' reading performances at the beginning and end of grade 3 (October 1990/May 1991) were identical. The test was developed under the auspices of the International Association for Educational Achievement (IEA) as part of the IEA Reading Literacy Study (Elley, 1992; Postlethwaite & Ross, 1992; Lundberg & Linnakylä, 1993; De Glopper & Otter, 1993). At the end of grades 4, 5 and 6 the pupils' reading achievement was measured by using standardized reading comprehension tests developed by the Dutch National Institute for Educational Measurement (CITO).

The reliability of the measurements of reading comprehension at the beginning of grade 3 and at the end of grades 3, 4, 5 and 6 was investigated using coefficient alpha. The reliability of all tests used was found to be good ($.90 < \text{alpha} < .91$). Another indication of the reliability and validity of the reading tests is provided by fitting a quasi-simplex model on the longitudinal data.

Insert here Model 1

In a quasi-simplex model it is assumed that the reading comprehension scores in grade 3, 4, 5 and 6 (the observed variables) are indicators of the latent variable reading comprehension. The correlation between the latent and the observed variables is another

indication of the reliability of the reading comprehension tests; the 'true' correlation between the latent variables is an indication of the stability of the variable reading comprehension.

Model 1 shows that the reliability of the reading comprehension test is at least .81 (grade 7) and maximal .92 (grade 6). Furthermore, the results from Model 1 are indicating that reading comprehension is a quite stable personal characteristic, the regression coefficients between the latent variables are very high: ≥ .89. The explained variance of the latent variables follow of the same pattern: R^2 is at least .78 (grade 8) and at most .88 (grade 7).

Leisure time reading

Leisure time reading is measured with diaries. Each pupil received a separate diary for each of the 36 diary weeks during the study. One page was reserved for each day in the diary. Every diary week began on a Tuesday with questions about the pupil's reading behaviour on Monday, and ended one week later on a Monday with questions about their reading behaviour on Friday, Saturday and Sunday (yes/no answers). The diaries were completed in school at the beginning of the morning; completing them took five minutes on average.

Four questions were asked to obtain more specific information about book reading behaviour. The students were asked to give (1) The title of the book, (2) The name of the author, (3) The number of pages read, and (4) The reading time (reading time only in grade 4, 5 and 6).

The reliability of the diary measurements in grades 3, 4, 5 and 6 was found to be good (.80 < alpha < .92). An other indication of the reliability of the reading tests is provided

by fitting a quasi-simplex model on the longitudinal data.

Insert here Model 2

In this model it is assumed that the mean reading frequency scores measured with the diaries in grade 3, 4, 5 and 6 (the observed variables) are indicators of the latent variable reading frequency. The correlation between the latent and the observed variables is an indication of the reliability of the diary scores; the 'true' correlation between the latent variables is an indication of the stability of the reading behaviour.

Model 2 shows that the reliability of the reading frequency scores is at least .83 (grade 6) and maximal 1.00 (grade 3 and 4). Furthermore, the results from Model 2 are indicating that reading at home becomes a stable personal characteristic as the students grow older. The regression coefficients between the latent variables of grade 3 and 4 and grade 4 and 5 are not very high namely .48 and .66, respectively. However, the regression coefficient between the latent variables of grade 5 and 6 is very high .98. The explained variances in the latent variables follow exact the same pattern.

The validity of the diary data was investigated by a study in which the diaries were completed a subsample of 202 students (attending ten different schools) and their parents. After correction for attenuation, the correlation between pupil and parent scores was .80.

Finally, the validity of the data was supported by a small study of the diaries of 46 studies. From the 378 titles which these students[2] had noted down in their diaries, 73%

[2] From this sample 23 students scored on the reading proficiency test at the beginning and end of grade 3 half a standard deviation below the mean score and 23 students scored half a standard deviation above the mean. The students didn't differ on several background variables such as age, sex, reading frequency,

could be identified by a computer catalogue, *without* making use of the author's name (De Leeuw, 1992).

DATA ANALYSIS

The relationship between leisure time reading and reading comprehension over time was investigated using covariance structural analysis via LISREL (Jöreskog & Sörbom, 1988). We have taken account of the hierarchical structure of the data (students in classes) by means of the multi-level procedure proposed by Muthén (Muthén, 1989, 1990; Hox, 1993), by fitting our models on the pooled-within covariance matrix (Muthén, 1989).

RESULTS

Insert Model 3 here

Model 3 gives the 'true' estimates of the standardized beta weights which relate to the postulated model that assumes that book reading affects reading proficiency. Where a beta weight is significant, this is indicated with an asterisk (*) in the figure.

Although the model is rejected by the χ^2 test (χ^2= 36.94, df= 19, p=.00), it fits reasonably well. The goodness-of-fit indices are acceptable. It is evident from Model 3 that the variable 'leisure time reading' has *no* significant effect on pupils' performances in reading comprehension. Model 3 also shows that reading books in grade 3, 4 and 5

reading aloud and for instance the social economic background

determines to a considerable extent the corresponding behaviour in grade 4, 5 and 6, respectively. However, this relationship is not perfect in the low grades of primary school: the 'true' correlations between reading books in grades 3 and 4 is .51, between grade 4 and 5 .66.

The modification indices suggest that the fit of model 3 can be improved by introducing effects of reading achievement on leisure time reading. Model 4 shows the 'true' estimates of the standard beta weights which relate to a model in which reciprocal effects are postulated. It is evident that Model 4 fits the data very well: χ^2= 20.33, df= 16, p.= 21). Since model 3 and 4 are hierarchically nested, we can use a formal χ^2 test to evaluate the difference between the models. The test indicates that the reciprocal model 4 is a significant improvement on model 3 (χ^2= 16.61, df=3, p= .00.). However, the beta weights are very small and suggest that the effects of reading achievement on leisure time reading are negligible.

A next question is whether the reciprocal model can be simplified. Model 5 gives the 'true' estimates of the standardized beta weights which relate to the model that assumes that *reading proficiency has an effect on book reading*. In other words, this model reverses the initial causal direction: good reading leads to more leisure time reading. Model 5 fits the data well (χ^2= 22.89, df= 20, p=.29). Compared to model 4 there is no significant decrease of fit (χ^2= 2.56, df= 4, p=.63). Model 4 indicates that the reading proficiency level in grade 4 has a significant but very small positive effect on the reading frequency in that grade.

DISCUSSION

The results of the present study conflict with the widely held assumption that leisure time reading is an important factor in the development of reading proficiency at school. *No* support was found for this generally accepted idea in this study. This raises numerous questions. Are the results artificial due to invalid comprehension tests or invalid measurements of leisure time reading? Are the results invalidated because important variables were omitted from the study? Or should the initial premise be reformulated?

The psychometric characteristics of our instruments (reading tests and reading diaries) do not indicate that the zero effects are caused by a lack of reliability or validity.

With regard to the argument that the results are invalidated due to omitted variables we like to consider the following. We have also measured the amount of television watching (grade 3, 4, 5 and 6), reading aloud to children (grade 3 and 4), and the amount of reading time at school (grade 3, 4, 5 and 6: reading technique, comprehension reading; leisure time reading, reading aloud; special projects in reading) and reading attitudes (grade 6). With the exception of reading attitudes, all variables mentioned were measured with diaries kept by the students (television watching and reading aloud) or their teachers (reading time at school) during eight, twelve, six and ten weeks in grade 3, 4, 5 and 6, respectively. None of the mentioned variables showed an effect on the reading proficiency level of the students[3]. For this reason, these variables were omitted from the models tested (cf. Model 3, 4 and 5).

We think that the initial premise must be reformulated. Leisure time reading may have an effect on the reading proficiency of students, only when (1) the amount of reading, (2) the quality of the reading process and (3) the quality of books being read reach certain

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[3] The one exception is TV viewing in grade 3: it has a significant but negligible effect on reading achievement. The standardized beta weight is -.058.

threshold values.

In the first place we believe that leisure time reading will have an effect on the reading proficiency only if the time spent exceeds a (yet unknown) time threshold. In our sample 37%, 48% and 51% of 4th, 5th and 6th grade students, respectively read *less* then fifteen minutes *per week*. The *top ten percent* of the leisure time readers in 4th, 5th and 6th grade read no more than fourteen, twelve and ten minutes a *day*, respectively[4]. We expect that for nearly all students the time threshold needed for causing positive effects on reading proficiency is not reached, especially when we take into account that in the Netherlands in grade 3, 4, 5 and 6 an average student reads 20 to 30 minutes *every* schoolday.

Secondly, we expect that a similar threshold level in the quality of the reading process must be met. Research in school reading has demonstrated that increasing the time for sustained silent reading hardly affects reading proficiency levels (Colins, 1980). What is needed is active involvement of students in the reading process. Straightforward reading should be supplemented with all kinds of mental activities before, during and after reading in order to increase comprehension skills (Pearson & Fielding, 1991). We wonder to what extent students perform such activities during leisure time reading.

Thirdly, we assume that the quality of the books being read matters. Students may learn and develop skills when confronted with stories and language that pose cognitive and linguistic challenges. Little learning can be expected form reading materials that are too easy or too hard. In future studies into the effects of leisure time reading the quality of reading materials should be taken into account mor explicitly.

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[4] The non-existent reading culture isn't only a Dutch phenomenon: our findings are very similar to German (Schmidbauer & Löhr 1985) and American findings (Timmer, Eccles & O'Brien 1985).

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TABLE 1

Number of participating schools and pupils

School Year	Grade	Schools	Classes	Pupils
1990/1991	3	40	42	973
1991/1992	4	36	41	958
1992/1993	5	30	30	758
1993/1994	6	30	30	736

Table 2:

arch design: Year, grade and month in which the reading test administrations (T1 - T5) took place and the students' diaries (PD1-PD36) about their leisure time reading collected

ar	Grade	October-November		January-March	May-June
)0-1991	3	T1	D01-D03	D04-D08	T2
)1-1992	4		D09-D12	D13-D20	T3
)2-1993	5			D21-D26	T4
)3-1994	6		D27-D30	D31-D36	T5

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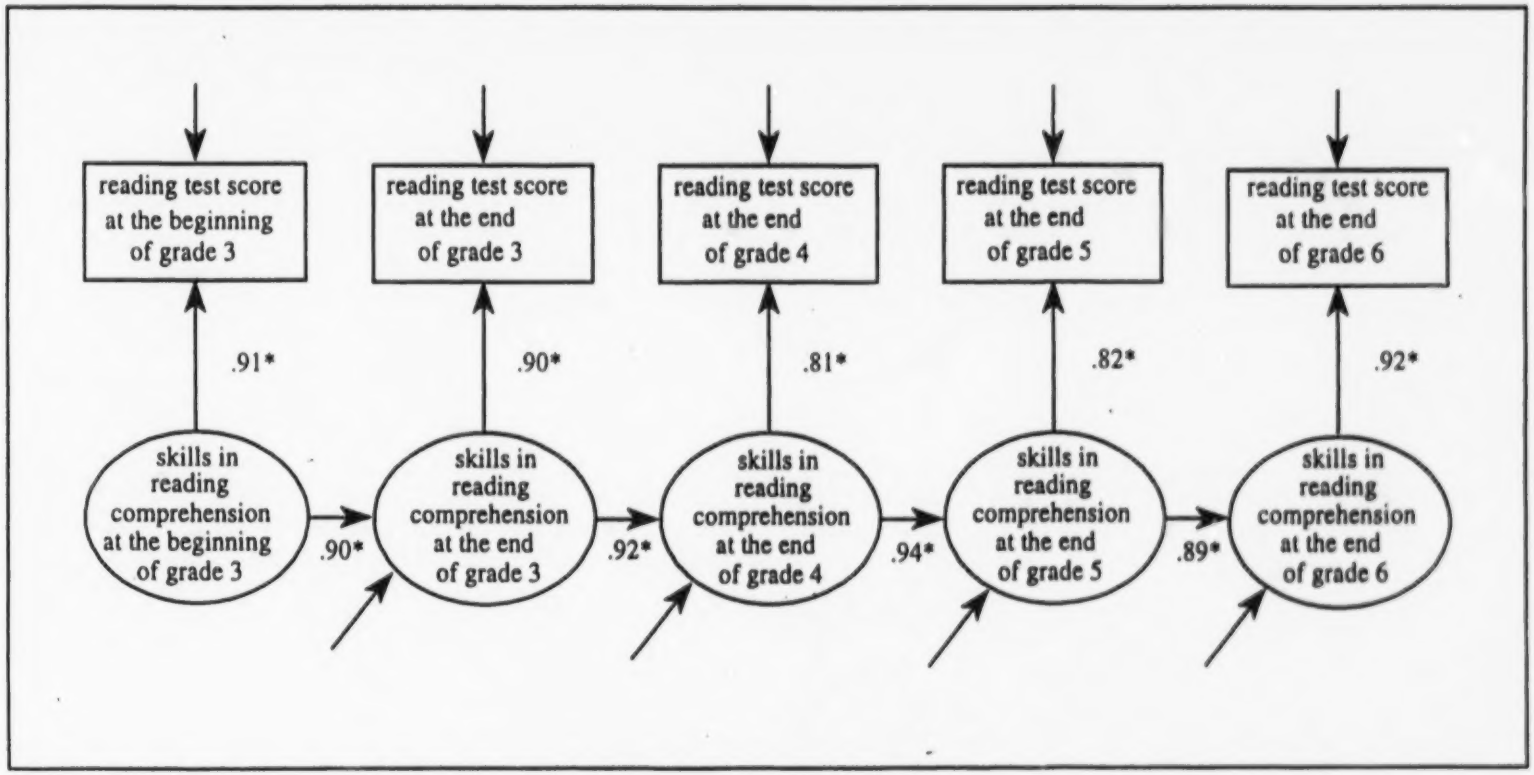
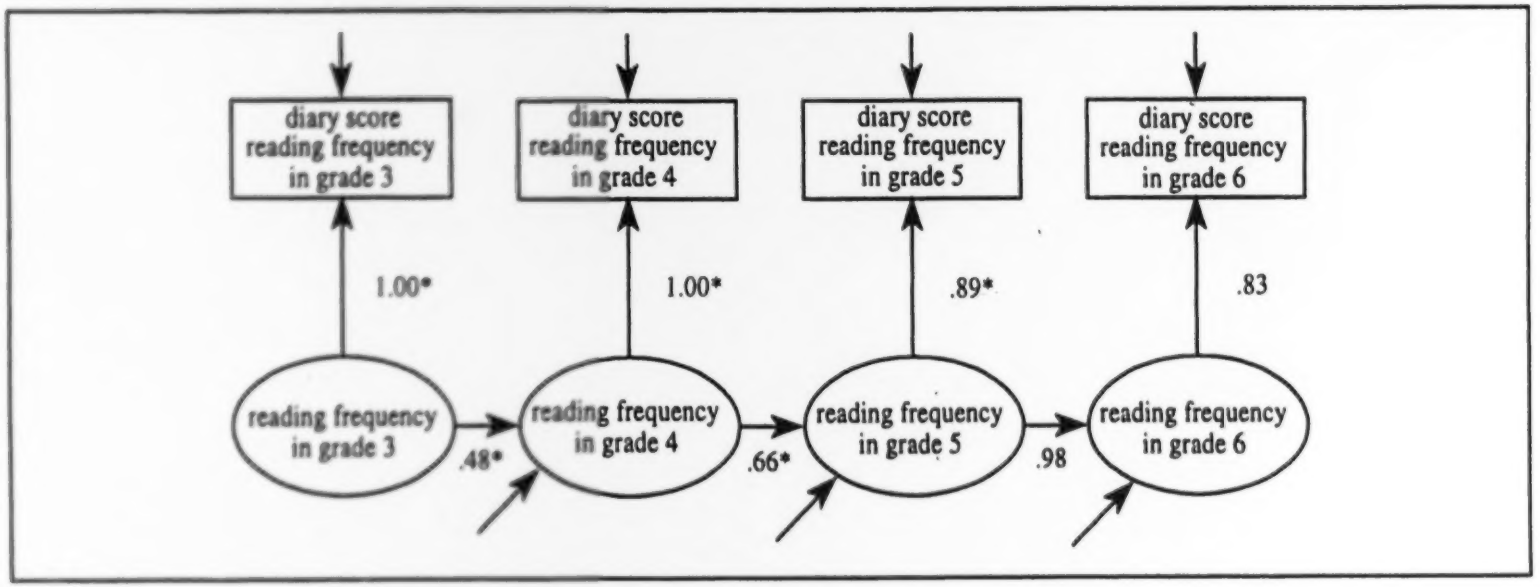
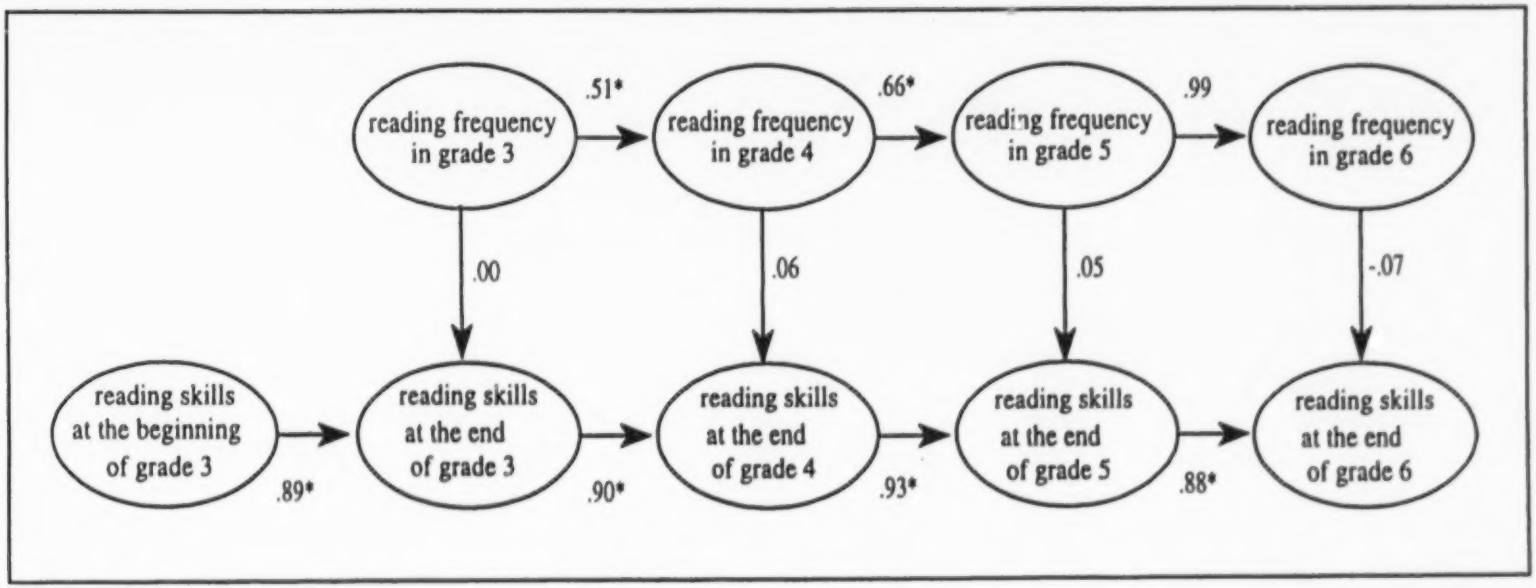

reading test score at the beginning of grade 3
reading test score at the end of grade 3
reading test score at the end of grade 4
reading test score at the end of grade 5
reading test score at the end of grade 6
.91*
.90*
.81*
.82*
.92*
skills in reading comprehension at the beginning of grade 3
skills in reading comprehension at the end of grade 3
skills in reading comprehension at the end of grade 4
skills in reading comprehension at the end of grade 5
skills in reading comprehension at the end of grade 6
.90*
.92*
.94*
.89*

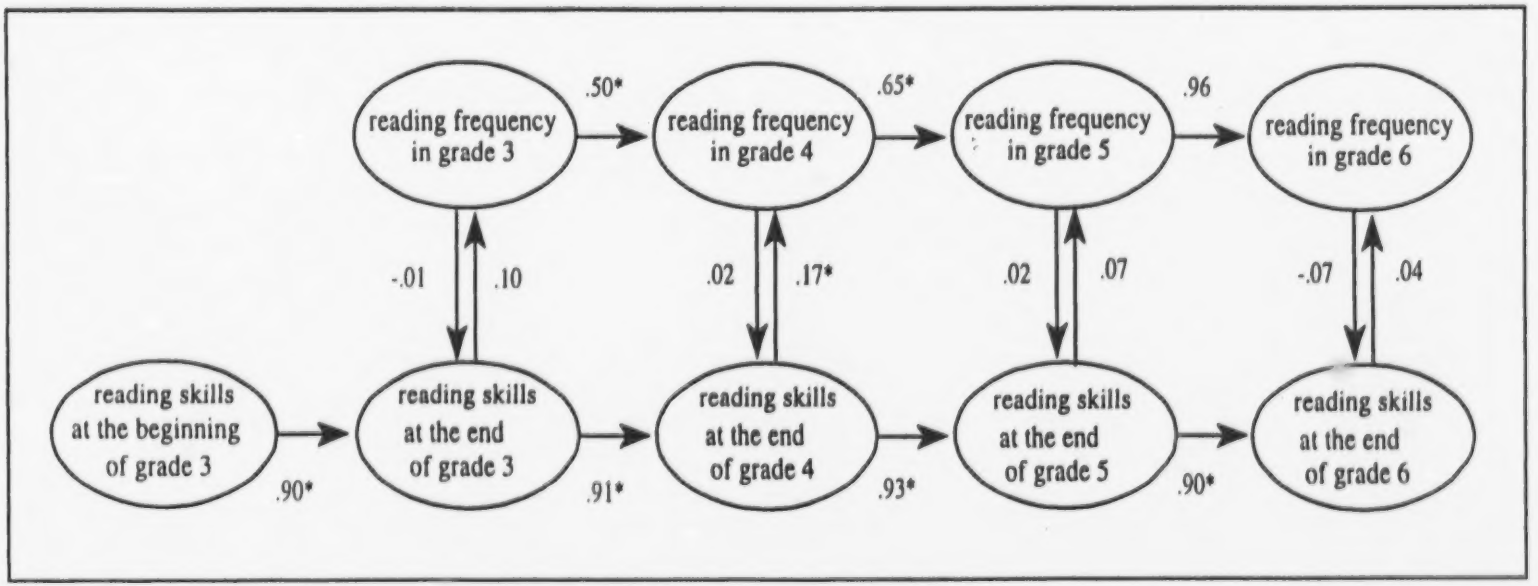
Model 1 χ^2= 3.18, df= 3, p= .37; Gfi= .997; Agfi= .987; Cfi= 1.00; *= p<.05



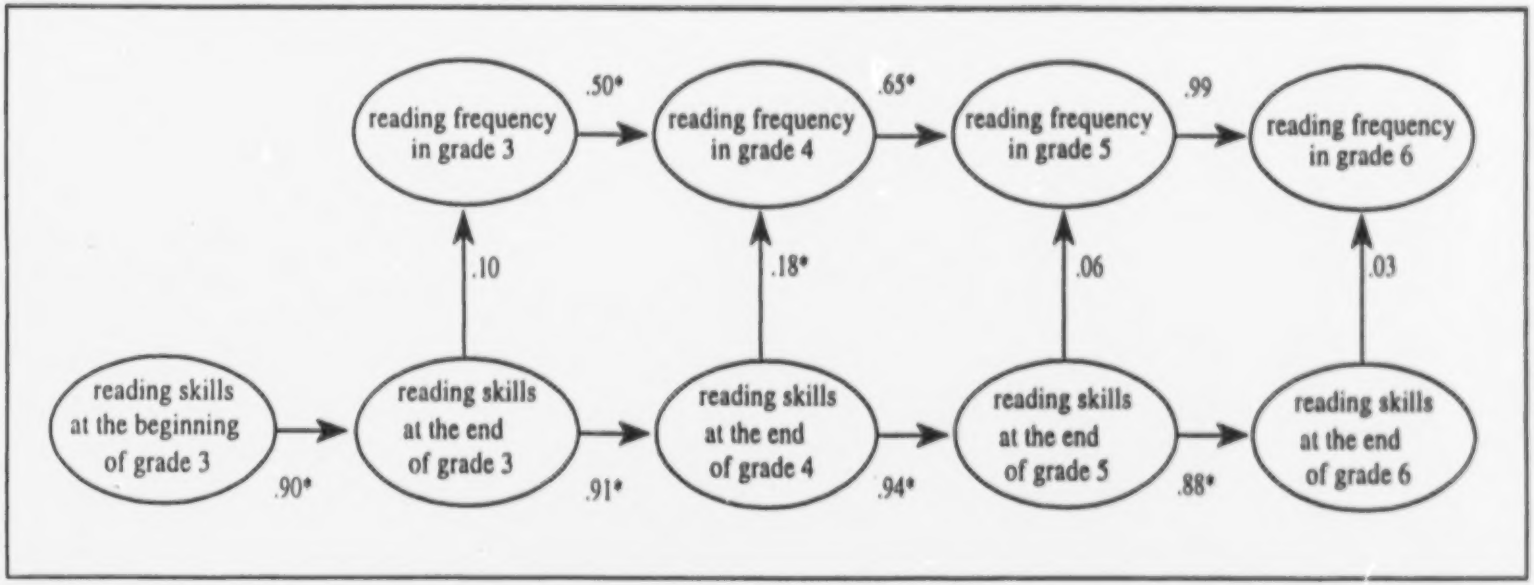
Model 2 χ^2= .92, df= 1, p= .34; Gfi= .999; Agfi= .992; Cfi= 1.00; *= p<.05



Model 3 χ^2= 36.94, df= 19, p= .00; Gfi= .983; Agfi= .959; Cfi= .991; *= p<.05



Model 4 χ^2= 20.33, df= 16, p= .21; Gfi= .990; Agfi= .973; Cfi= .988; *= p<0.05



Model 5 χ^2= 22.89, df= 20, p= .29; Gfi= .990; Agfi= .977; Cfi= .999; *= p<.05